ABSTRACT
        To aid institutions in identifying and using
information about educational outcomes, the National Center for
Higher Education Management Systems (NCHEMS) developed an "outcome
structure," a new system for organizing outcomes and outcomes
information for purposes of classification, analysis and
decisionmaking. Preliminary tryout and review of this structure
suggest that it has potential use in: stimulating people to realize
the importance of having information about educational outcomes;
stimulating people to think more systematically and concretely about
what they are trying to accomplish in their institutions and programs
(and for whom); helping institutional officials to identify
educational needs, develop goals, translate goals into more concrete
objectives, plan for outcomes, elevate the institution and its
program; and improving communications with clientele and concerned
publics. One of the projects used to try out the NCHEMS Outcomes
Structure is reported. It was conducted in the winter of 1977 by the
University of Colorado at Boulder. (Author/SPG)

USING THE NCHEMS OUTCOMES STRUCTURE TO TEST THE ADEQUACY
OF OUTCOMES LISTS: TRYOUT AT A STATE UNIVERSITY[a]

Jean J. Endo
Researcher
Academic Affairs
University of Colorado
Boulder, Colorado 80309

Oscar T. Lenning
Staff Associate
National Center for Higher
   Education Management Systems
P.O. Drawer P
Boulder, Colorado   80302

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Jean J. Endo
University of Colorado, Boulder

Oscar T. Lenning
National Center for Higher
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All of the major activities conducted by administrators, faculty, and
other professional staff members at postsecondary institutions are, presumably,
aimed in some way toward bringing about "educational outcomes." In this "age
of accountability," college administrators and others have become especially
concerned about concretely identifying and understanding the impacts of their
institution on students, the community, and society. After two years of concen-
trated effort, the National Center for Higher Education Management Systems
(NCHEMS) developed an "outcomes structure," a new system for organizing outcomes
and outcomes information for purposes of classification, analysis and decision-
making (Lenning, Lee, Micek, and Service, 1977). Preliminary tryout and review
of this structure suggests that it has potential use in: (1) stimulating people
to realize the importance of having information about educational outcomes;
(2) stimulating people to think more systematically and concretely about what
they are trying to accomplish in their institutions and programs (and for whom);
(3) helping institutional officials to identify educational needs, develop goals,
translate goals into more concrete objectives, plan for the outcomes, evaluate
the institution and its programs; and (4) improving communication about outcomes
with clientele and concerned publics; and so forth (for example, several students
and student personnel administrators interviewed at a couple of small colleges
felt that the Structure could also be used to assist students in planning what
they want to accomplish for themselves during college).

This is a report of one of the projects used to try out the NCHEMS Outcomes
Structure in a preliminary way. It was conducted in the winter of 1977 by the

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University of Colorado at Boulder. Over a period of several years, through surveys and interviews of important clientele groups, several extensive lists of intended outcomes were developed by staff of the Office of the Vice Chancellor for Academic Affairs on the Boulder Campus that were comprehensive for their planning needs. The NCHEMS Outcomes Structure was applied to these lists in a way that would reveal the adequacy of the coverage of those lists-- using step-by-step procedures that had been developed at NCHEMS (Lenning, 1977). This process revealed several outcomes areas considered to be important that had been overlooked in developing the lists. The lists were modified, along with the Freshman Questionnaire which had been based in part on the lists. The remainder of this paper will go into detail about this project and its results.

THE NCHEMS OUTCOMES STRUCTURE

The purposes of the Outcomes Structure have been outlined in the introduction to the paper. The Structure consists of three dimensions along which outcomes or information about outcomes can be placed and related to one another. The structure is based on a conceptual framework that defines six attributes of educational outcomes in postsecondary education plus five other factors that are important for understanding particular outcomes (Lenning, Micek, and Service, 1978; Lenning, Lee, Micek, and Service, 1979). The three dimensions of the structure are described below:

o Audience -- The "audience" dimension focuses on who or what receives or is affected by the outcome of concern, or is intended to receive or be affected by it. It has five broad categories, and subcategories for them, as outlined in Figure 1.

o Type of Outcome -- The "type-of-outcome" dimension focuses on whether the
   outcome results in maintenance (stabilization, reproduction, or
   preservation) or change (reorganization, modification, revision, or
   replacement), and on the basic entity within the audience that is
   maintained or changed. This dimension also has five broad cate-
   gories, and each is subdivided into categories and subcategories of
   increasingly more detail and specificity, as outlined in Figure 2.
   Standard definitions are provided for every category and subcategory
   of this dimension, along with illustrative examples of outcomes
   measures and indicators for each.

o Time -- The "time" dimension focuses on when the outcome is expected to
   or does occur, and on how long the outcome persists. The categories
   and subcategories for the "time" dimension that are deemed most
   appropriate vary, depending on the audience of concern, on the philo-
   sophy of the person using the Structure, and on the context in which
   the Structure is being used. (For example, its use at the institu-
   tion-wide level may very well require different time categories than
   its use at the institutional program level.) To illustrate this,
   two quite different student outcome sets of categories that could be
   used for the "time" dimension are shown in Figures 3 and 4. The one
   presented in Figure 4, is the time classification used by the Univer-
   sity of Colorado at Boulder to follow the chronological path taken
   by new freshmen through their educational careers. Identification
   of the times when different data should be collected is valuable in
   planning.

Figure 1

CATEGORIES AND SUBCATEGORIES OF THE
AUDIENCE DIMENSION OF THE NCHEMS OUTCOMES STRUCTURE[a]

10. *Individual/Group Clients*—This category refers to persons or groups of persons who are direct clients of the postsecondary education unit of concern and/or their immediate associates, such as family and relatives or peers.

11. *Students*—Individuals or groups of individuals who currently are enrolled in the program, institution, or system of postsecondary education.

12. *Former Students*—Individuals or groups of individuals who formerly were enrolled in the program, institution, or system of postsecondary education.

13. *Family and Relatives of Students or Former Students*

14. *Peers and Associates of Students or Former Students*

15. *Faculty*

16. *Staff Other than Faculty*

17. *Other Individual/Group Clients*—An example would be an individual who is none of the above but is served by an advisory service offered by the college.

20. *Interest-Based Communities*—This category refers to large groups that are identified as entities working toward a *well-defined interest or mission.*

21. *Private Enterprise Communities*—Communities where a major purpose is financial remuneration and profit—for example, corporations, small businesses, and farmers.

22. *Association Communities*—Communities where members belong on the basis of affiliation rather than employment, such as unions and professional societies.

23. *Government Communities*—Communities designed to administer government regulations and services, such as city hall, state department of education, and legislative communities.

24. *Nongovernmental/Public Service Communities Other than the Institution Producing the Outcome*—Nonprofit service organizations, such as schools, hospitals, welfare agencies, philanthropic foundations, colleges (other than the college producing the outcome), and research organizations.

25. *Institution or Institutional Unit Producing the Outcome*—The postsecondary education institution and/or units within that institution that are perceived as the producer/facilitator of the outcome(s) of concern.

26. *Other Interest-Based Communities*—An example would be an ad hoc coalition task force of representatives from two or more of the above areas.

30. *Geographic-Based Communities*—This category refers to large groups defined on the basis of *functional territorial boundaries.*

31. *Local Community*—A township, city, county, metropolitan area or other type of locality having particular boundaries. It is not necessarily restricted to the legal or jurisdictional boundary, but the functional one in which the impact of the institution is (or should be) directly and physically felt. The boundaries will vary with the institution/program and outcome of concern.

32. *The State*

33. *A Region*—An aggregation of states or parts of states.

34. *The Nation*

35. *An International Community*

36. *Other Geographic-Based Communities*—An example would be a research discovery that affects primarily people living in the coldest latitudes, or where it snows heavily.

40. *Aggregates of People*—This category refers to subpopulations of people *distinguished by particular characteristics that may indicate common concerns, needs or wants,* but who do not necessarily have a common interest or mission, and therefore do not constitute communities.

41. *Ability Level Subpopulations*—Subpopulations defined according to level of ability/proficiency on general intellectual functioning or specific skills—for example, gifted, typical, disadvantaged, or skilled, semi-skilled, unskilled.

42. *Age Subpopulations*

43. *Educational Level Subpopulations*

44. *Income Level Subpopulations*

45. *Occupation Subpopulations*

46. *Physical Disability Condition Subpopulations*

47. *Race Subpopulations*

48. *Sex Subpopulations*

49. *Other Such Aggregates*

50. *Other Audiences*—Examples would be the natural environment if it is affected by university-sponsored research (which in turn would be expected to have impacts on audiences such as individuals and communities) and populations of animals (such as the animals affected by efforts to keep depleted species from becoming extinct or by the development of veterinary medicines).

[a]Reprinted from Lenning, Lee, Micek, and Service (1977), page 24.

Figure 2
FOCUS CATEGORIES AND SUBCATEGORIES IN THE
TYPE-OF-OUTCOME DIMENSION OF THE NCHEMS OUTCOMES STRUCTURE[a]

Category Code Number	Entity Being Maintained or Changed	Category Code Number	Entity Being Maintained or Changed
1000	**ECONOMIC OUTCOMES**	**2000**	**HUMAN CHARACTERISTIC OUTCOMES** (continued)
		2760	Power and/or Authority
1100	Economic Access and Independence Outcomes	2770	Job, School, or Life Success
1110	Economic Access	2780	Other Status, Recognition, and Certification Outcomes
1120	Economic Flexibility, Adaptability, and Security	2800	Social Activities and Roles
1130	Income and Standard of Living	2810	Adjustment to Retirement
		2820	Affiliations
1200	Economic Resources and Costs	2830	Avocational and Social Activities and Roles
1210	Economic Costs and Efficiency	2840	Career and Vocational Activities and Roles
1220	Economic Resources (including employees)	2850	Citizenship Activities and Roles
		2860	Family Activities and Roles
1300	Economic Production	2870	Friendships and Relationships
1310	Economic Productivity and Production	2880	Other Activity and Role Outcomes
1320	Economic Services Provided		
		2900	Other Human Characteristic Outcomes
1400	Other Economic Outcomes		
2000	**HUMAN CHARACTERISTIC OUTCOMES**	**3000**	**KNOWLEDGE, TECHNOLOGY, AND ART FORM OUTCOMES**
2100	Aspirations	3100	General Knowledge and Understanding
2110	Desires, Aims, and Goals	3110	Knowledge and Understanding of General Facts and Terminology
2120	Dislikes, Likes, and Interests	3120	Knowledge and Understanding of General Processes
2130	Motivation or Drive Level	3130	Knowledge and Understanding of General Theory
2140	Other Aspirational Outcomes	3140	Other General Knowledge and Understanding
2200	Competence and Skills	3200	Specialized Knowledge and Understanding
2210	Academic Skills	3210	Knowledge and Understanding of Specialized Facts and Terminology
2220	Citizenship and Family Membership Skills	3220	Knowledge and Understanding of Specialized Processes
2230	Creativity Skills		
2240	Expression and Communication Skills	3230	Knowledge and Understanding of Specialized Theory
2250	Intellectual Skills	3240	Other Specialized Knowledge and Understanding
2260	Interpersonal, Leadership, and Organizational Skills	3300	Research and Scholarship
2270	Occupational and Employability Skills	3310	Research and Scholarship Knowledge and Understanding
2280	Physical and Motor Skills	3320	Research and Scholarship Products
2290	Other Skill Outcomes		
		3400	Art Forms and Works
2300	Morale, Satisfaction, and Affective Characteristics	3410	Architecture
2310	Attitudes and Values	3420	Dance
2320	Beliefs, Commitments, and Philosophy of Life	3430	Debate and Oratory
2330	Feelings and Emotions	3440	Drama
2340	Mores, Customs, and Standards of Conduct	3450	Literature and Writing
2350	Other Affective Outcomes	3460	Music
		3470	Painting, Drawing, and Photography
2400	Perceptual Characteristics	3480	Sculpture
2410	Perceptual Awareness and Sensitivity	3490	Other Fine Arts
2420	Perception of Self		
2430	Perception of Others	3500	Other Knowledge, Technology, and Art Form Outcomes
2440	Perception of Things		
2450	Other Perceptual Outcomes		
2500	Personality and Personal Coping Characteristics	**4000**	**RESOURCE AND SERVICE PROVISION OUTCOMES**
2510	Adventurousness and Initiative		
2520	Autonomy and Independence	4100	Provision of Facilities and Events
2530	Dependability and Responsibility	4110	Provision of Facilities
2540	Dogmatic/Open-Minded, Authoritarian/Democratic	4120	Provision or Sponsorship of Events
2550	Flexibility and Adaptability	4200	Provision of Direct Services
2560	Habits	4210	Teaching
2570	Psychological Functioning	4220	Advisory and Analytic Assistance
2580	Tolerance and Persistence	4230	Treatment, Care, and Referral Services
2590	Other Personality and Personal Coping Outcomes	4240	Provision of Other Services
2600	Physical and Physiological Characteristics	4300	Other Resource and Service Provision Outcomes
2610	Physical Fitness and Traits		
2620	Physiological Health		
2630	Other Physical or Physiological Outcomes	**5000**	**OTHER MAINTENANCE AND CHANGE OUTCOMES**
2700	Status, Recognition, and Certification	5100	Aesthetic-Cultural Activities, Traditions, and Conditions
2710	Completion or Achievement Award	5200	Organizational Format, Activity, and Operation
2720	Credit Recognition	5300	Other Maintenance and Change
2730	Image, Reputation, or Status		
2740	Licensing and Certification		
2750	Obtaining a Job or Admission to a Follow-up Program		

[a]Reprinted from Lenning, Lee, Micek, and Service (1977), page 27. The fourth-level Categories, into which any of the categories listed here can be divided, are "maintenance" (a fourth digit of "1") and "change" (a fourth digit of "2").

Figure 3
ONE POSSIBLE SET OF STUDENT OUTCOME
CATEGORIES FOR THE TIME DIMENSION[a]

10. Short-Duration Outcomes	
11. Short-duration outcomes appearing at or prior to graduation	12. Short-duration outcomes appearing after graduation

20. Long-Duration Outcomes	
21. Long-duration outcomes appearing at or prior to graduation	22. Long-duration outcomes appearing after graduation

[a]Reprinted from Lenning, Lee, Micek, and Service (1977), page 29.

Figure 4

TAXONOMY OF TIMES TO CONSIDER FOR COLLECTING UNDERGRADUATE
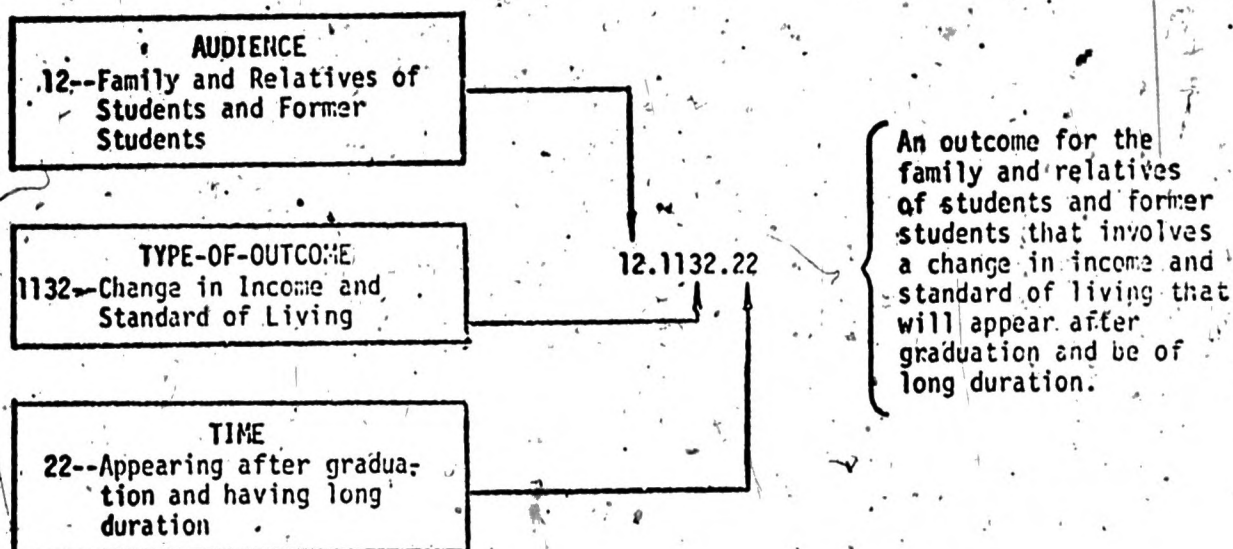
STUDENT OUTCOMES DATA USING SURVEY QUESTIONNAIRES[a]

100 Data from Lower Division Students

   110 Data from Freshmen Students

      111 Data collected Prior to Fall Registration
      112 Data collected One Month Following the First Day of Classes
          in the Fall
      113 Data collected One Month Prior to First Semester Final Exams
      114 Data collected One Month After Spring Semester Classes Begin
      115 Data collected One Month Prior to Spring Semester Final Exams
      116 Other, For Example, In the Middle of the Summer Term

   120 Data From Sophomore Students

      121 Data Collected Prior to Fall Registration
      122 Data Collected One Month Following the First Day of Classes
          in the Fall
      123 Data Collected One Month Prior to First Semester Final Exams
      124 Data Collected One Month After Spring Semester Classes Begin
      125 Data Collected One Month Prior to Spring Semester Final Exams
      126 Other, For Example, In the Middle of the Summer Term

200 Data From Upper Division Students

   210 Data From Junior Students

      211 Data collected Prior to Fall Registration
      212 Data collected One Month Following the First Day of Classes
          in the Fall
      213 Data collected One Month Prior to First Semester Final Exams
      214 Data collected One Month After Spring Semester Classes Begin
      215 Data collected One Month Prior to Spring Semester Final Exams
      216 Other, For Example, In the Middle of the Summer Term

   220 Data From Senior Students

      221 Data Collected Prior to Fall Registration
      222 Data Collected One Month Following the First Day of Classes
          in the Fall
      223 Data Collected One Month Prior to First Semester Final Exams
      224 Data Collected One Month After Spring Semester Classes Begin
      225 Data Collected One Month Prior to Spring Semester Final Exams
      226 Other, For Example, In the Middle of the Summer Term

300 Data from Alumni

      310 Data Collected at Graduation
      320 Data Collected One Year After Graduation
      330 Data Collected Five Years After Graduation
      340 Other, For Example, Data Collected 20 Years After Graduation

400 Other, For Example, Data Collected After Students Have "Dropped Out"

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[a]Reprinted from Lenning (1977), page 8. These categories and subcategories are based specially on the data collection experiences of staff in the Office of the Vice Chancellor for Academic Affairs at the University of Colorado, Boulder. Therefore, they may not be entirely appropriate for other postsecondary institutions.

When the three dimensions are put together, they can be pictured graphically as a three dimensional series of cubes formed by the categories for one of the dimension intersecting each of the categories of the other two dimensions. This is illustrated below for the broadest categories of each dimension.

TYPE-OF-OUTCOME DIMENSION
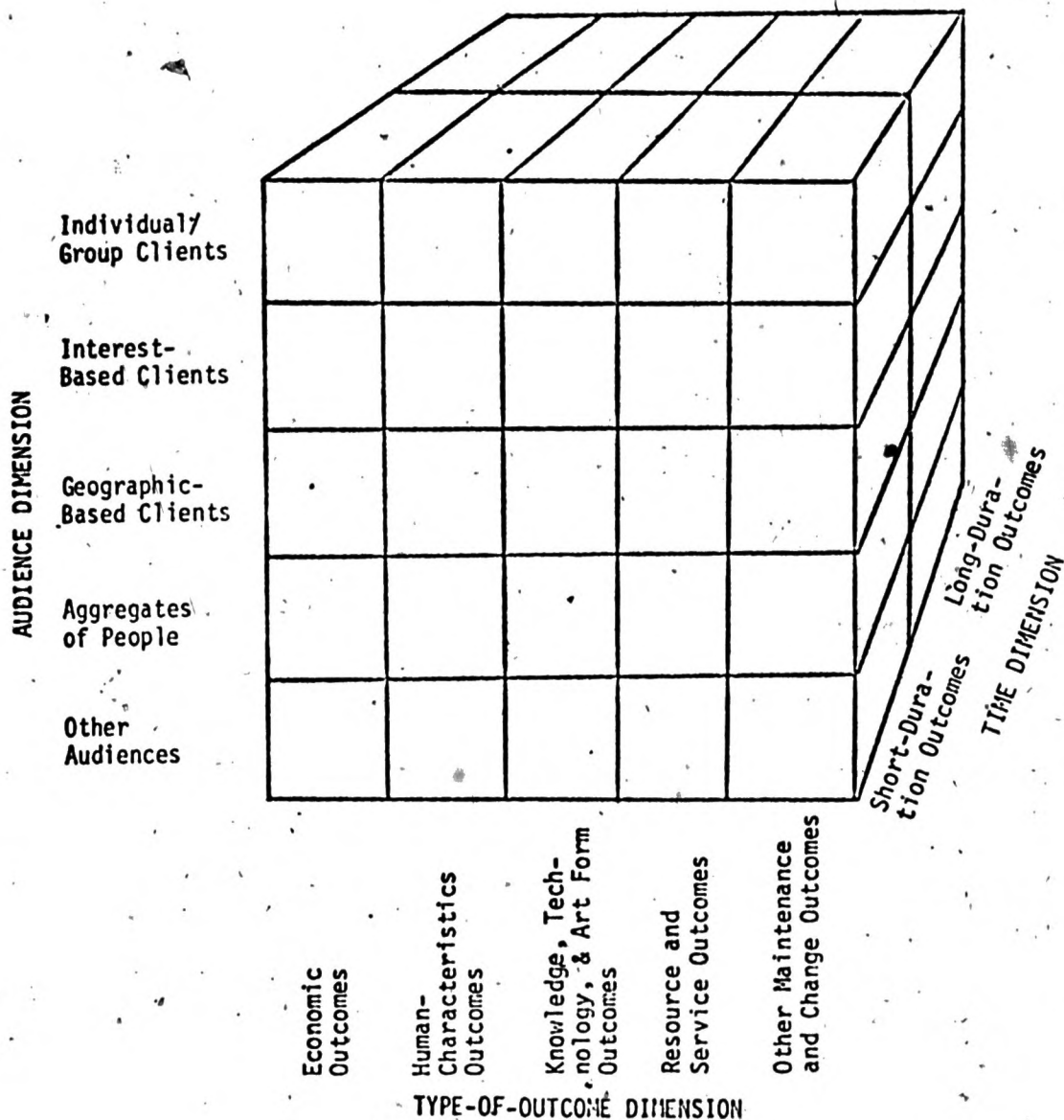
It is illustrated at a more detailed outcome category level as follows, using the category code numbers shown in Figures 1-3:

```
┌─────────────────────────────────┐
│           AUDIENCE              │
│ .12--Family and Relatives of    │
│      Students and Former        │
│      Students                   │
└─────────────────────────────────┘
                                          ⎧ An outcome for the
┌─────────────────────────────────┐      ⎪ family and relatives
│        TYPE-OF-OUTCOME          │      ⎪ of students and former
│ 1132--Change in Income and      │  12.1132.22  ⎨ students that involves
│       Standard of Living        │      ⎪ a change in income and
└─────────────────────────────────┘      ⎪ standard of living that
                                          ⎪ will appear after
┌─────────────────────────────────┐      ⎪ graduation and be of
│            TIME                 │      ⎩ long duration.
│ 22--Appearing after gradua-     │
│     tion and having long        │
│     duration                    │
└─────────────────────────────────┘
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When the dimensions are combined at the level of detail illustrated above, they provide several thousand distinct "cells". The categories within the Structure are believed to cover the full range of possible audiences and types of outcomes, and procedures are provided for subdividing to even more detailed subcategories than provided by the Structure. Thus, when all of the outcomes in a list are categorized using the Structure and step-by-step procedures for this purpose, areas of the Structure that have no outcomes assigned to them (or fewer than expected or wanted) become readily apparent. Then, if desired, specific priority outcomes for those areas that seem lacking can be generated using another set of procedures that have been developed. This, in summary, is the process that was used in this tryout of the Structure.

THE UNIVERSITY OF COLORADO OUTCOMES LIST AND ITS DEVELOPMENT

The Student Outcomes Planning Model is a descriptive model that identifies the relevant features of a student's educational environment and experience. These features are considered valuable educational expectations by students and the academic community. The Model is used to guide the collection of information on students that will help in the planning and management functions of an institution.

This Model[1] helped guide the development of the outcomes list used by the University and is based on the notion that information about students is useful in planning and management. In addition to institutional inputs (such as library books, facilities) and student inputs (such as ability), the educational process and its environment are the important variables which can be altered to produce beneficial educational outcomes (such as employment skills, grade point average). These institutional and student inputs could be combined in different educational processes to produce different levels and kinds of outputs. Educational processes include modes and styles of instruction and course curriculum. The Model evolved at the institution in 1975 to assist internal management, to provide information for external accountability, and academic planning. Academic planning includes needs assessment, program development, resource allocation (budgeting), and evaluation.

The Model allows for the systematic collection of student data through the use of surveys. The Model facilitates the coordination of basic student-related questionnaires and the results can be incorporated into a larger, more extensive academic planning model (Meyerson and Banfield, 1955). Other important items of outcomes information which are available through institutional records (for example, college entrance exam scores and undergraduate grade point average) are not included. The Model is designed to identify those items that must be collected directly from students.

The Student Outcomes Planning Model includes students' background, attitudes, values, aspirations, abilities, and the extent of change in these variables. The Model, shown in Figure 5, consists of four basic questionnaires: 1) Freshman Questionnaire, 2) Exiting Students' Survey, 3) Graduating Students' Questionnaire, and 4) Alumni Survey. The Model allows for longitudinal (cohort) and cross-sectional analysis.

[1] Developed by Richard L. Harpel and Jean J. Endo

Figure 5
STUDENT OUTCOMES PLANNING MODEL
FOR
THE UNIVERSITY OF COLORADO--BOULDER

FRESHMEN

DEMOGRAPHIC CHARACTERISTICS

Academic ability
Financial support

PREVIOUS EDUCATIONAL EXPERIENCES

**ASPIRATIONS/EXPECTATIONS/
MOTIVATIONS**

Reasons for choosing CU
Highest degree planned
Career plans

SELF EVALUATION

Academic
Social

CRITICAL THINKING ORIENTATION

GOALS/VALUES

EXITING STUDENTS

TIME OF DEPARTURE

REASONS FOR LEAVING

FINANCIAL SUPPORT

**EVALUATION OF UNIVERSITY
ENVIRONMENT**

Academic
Social

UNMET NEEDS

FUTURE PLANS

GRADUATING STUDENTS

ACADEMIC ACHIEVEMENT

Grade point average
Degree type
Basic academic skills
Critical thinking
orientation
Satisfaction with college
experience

CAREER DEVELOPMENT

Major or field of study
Highest degree planned
Importance of job factors
Satisfaction with college
experience

PERSONAL/SOCIAL DEVELOPMENT

Interpersonal skills
Personal talents/creativity
Appreciation for culture
Understanding different
cultures/ideas

**EVALUATION OF UNIVERSITY
ENVIRONMENT**

Academic
Social

ALUMNI

OCCUPATIONAL SUCCESS

Positions held
Skills required
Assessment of skills
Job characteristics
Flexibility in field
changes
Satisfaction with
job
Satisfaction with
college preparation

**FURTHER ACADEMIC
EXPERIENCES**

Graduate School
Continuing education
Military occupational
training

COMMUNITY ACTIVITY

Clubs/organizations

POLITICAL PARTICIPATION

Elections
National events/
local activities

CULTURAL INTEREST

Level of participation
Breadth of interest

Longitudinal studies involve testing the same students (cohorts) several times in their college career with the same instrument. Questionnaires are given to students as freshmen, exiting students, graduating students, and alumni. The testing of cohorts controls for many external variables such as family background and basic ability. Unfortunately, much needed and useful data is not produced early in the process.

Cross-sectional studies includes responses from a sample of students representative of those at different class levels and are measured at the same point in time. Change is inferred by comparison between classes assuming that the students have similar demographic characteristics. Of course, the removal of dropouts would alter the student characteristics. Cross-sectional studies are performed on exiting students, graduating students, and alumni.

The Model is currently in its third year of testing--incorporating both the longitudinal and cross-sectional surveys to determine response differences. It is hoped that within two years the University will be able to minimize the length of the surveys and use only those instruments needed to provide student data necessary for efficient planning and management of campus programs.

The Student Outcomes Planning Model centers around 22 student related goals and their measures which are listed in the Freshman Questionnaire. The relative importance of each goal reflects students' expectations while attending the University. Student interests are an important component of educational planning. Administrators can balance the needs of various student populations and the different preferences of various educational experts. Several measurable objectives from the Higher Education Measures and Evaluation KIT (C. Robert Pace, 1975) were assigned to each goal. For example, the goal "to gain self-confidence: is measured by responses to the following statements: a) "I am a person of worth and on an equal plane with others", b) "My confidence in myself is strong enough so that it doesn't bother me if people don't like me", c) "I seem to have inner strength in handling things".

In addition to the Pace and Associates KIT, a number of other sources in the literature were referred to in devloping the Model[2] and its associated questionnaires. To date, the Boulder Campus has completed a 1975 Freshman Questionnaire and a 1977 Freshman Questionnaire and is currently developing an Exiting Students' Survey to be completed in 1978. The freshman surveys will be administered every two years to provide descriptive information and establish trends. Trends in measures of objectives are useful in determining whether an outcome is in the desired direction. The exiting survey will compare students who have temporarily or permanently left the institution with those who have remained. It will identify the stopouts, transferouts, and dropouts. It will determine why students leave the campus, the time they left, amount of financial support received, and what their future plans will be.

The Graduating Students' Survey will be administered in 1979. It will include questions that attempt to measure academic achievement, career development, personal/social development, and an evaluation of the University's environment. One year later, the alumni survey will measure occupational success, further academic experiences, community activities, political participation, and cultural interests.

PROCEDURE USED BY THE UNIVERSITY IN THE CLASSIFICATION OF THE ITEMS ON ITS
OUTCOMES LIST

The University of Colorado outcomes list was derived in part from the Student Outcomes Planning Model, and in part from other sources. Although the primary focus of the list is on student outcomes, a few outcomes for other audiences are also included, that are not student outcomes but might

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[2]Additional sources used in developing the Model were Schalman, et al. (1974), Baird (1967), Baldridge (1971), Bloom (1956), Clapp (1946), Cohen and and March (1974), Fox (1974), Peterson (1973), Richman and Farmer (1974), Trivette (1973), Meyerson and Banfield (1955), and Micek and Arney (1974).

be expected to relate to student outcomes, for example, number of publications by faculty, number of books in the library, and number of events and type sponsored by the departments or universities.

Two of the basic processes developed by the NCHEMS staff for using the Structure were involved in this study. Systematic, straight forward, step-by-step procedures for each of the processes are provided in Lenning (1977). First, process No. 2--classifying outcomes items--was used, to classify all items in the University of Colorado outcomes list. Then Process No. I was applied in order to evaluate the adequacy of the list, in terms of whether important outcomes desired by the University community have been left out.

PROCESS NO. 2--CLASSIFYING THE OUTCOMES ON THE LIST

The desired "audience" for classification was determined to be current and graduating students (Code No. 11). First, each outcome on the University of Colorado list was classified in terms of the broadest type-of-outcome categories. Then each was grouped into the more detailed categories at the second and third levels of detail for that dimension of the Structure. Procedures are provided for adding additional levels of detail, using available taxonomies that go into still more detail, for example, Bloom's (1956) taxonomy of the cognitive domain, or using a logical array developed locally. At this University it decided that the third-level Structure categories were adequate for their academic planning purposes.

Table 1 shows the University of Colorado's listing of outcome items (right half of each page) and the Structure categories that each was classified into (left half of each page). It was noticed that a number of Structure categories did not have outcomes list items assigned to them. It was felt that there might be additional outcomes categories to which some outcomes from the list had been assigned so Process No. 1 Procedures followed.

Table 1

THE OUTCOMES LIST ITEMS PLUS THE STRUCTURE CATEGORY INTO WHICH EACH WAS PLACED

"AUDIENCE"--SENIOR STUDENTS AT CU

NCHEMS Category Code Number	NCHEMS Type-of-Outcome Category Name	Items Included on the University of Colorado Outcomes List
	ECONOMIC OUTCOME (Code 1000) CATEGORIES	
1130	Income and Standard of Living	- Family income
	HUMAN CHARACTERISTIC (Code 2000) CATEGORIES	
2110	Desires, Aims, Goals	- Change in students' goals, desires, aspirations as a result of college
2210	Academic Skills	- Grades earned by students
		- Persistence in college.
		- Self-report of ability in math, writing, reading and comprehension
2230	Creativity Skills	- Changes in test score that measure originality and creative ability
		- Self-report of development and activity
2250	Intellectual Skills	- Change in students' ability to analyze or solve problems
		- Measure critical thinking activity by developing an "index score"
2270	Occupational Skills	- Demonstrated ability to perform specific tasks
		- Self-report of occupational skills
2310	Attitudes, Values	- Effect of college on attitudes and values
2420	Perception of Self	- Self-confidence measure
		- Expectations
2620	Autonomy and Independence	- Measures of independence
2680	Tolerance and Persistence	- Measures of tolerance and persistence
2710	Completion or Achievement Award	- Graduation diploma
		- Special awards
2740	Licensing and Certification	- Percent passed specific licensing exams

Table 1 (continued)

HUMAN CHARACTERISTIC CATEGORIES (continued)

2750	Obtaining a Job or Admission to a Follow-up Program	- Percent who received jobs
		- Percent who were accepted to graduate programs
2840	Career and Vocational Roles	- Self-report

KNOWLEDGE, TECHNOLOGY, AND ART FORM OUTCOME (Code 3000) CATEGORIES

3110	Knowledge and Understanding of General Facts and Terminology	- CLEP exam score
		- Graduate Record Exam score
		- Self-report
3120	Knowledge and Understanding of General Processes	- Comprehension of general processes and methods
		- Student grades in a general survey course
3210	Knowledge and Understanding of Specialized Facts and Terminology	- Scores on tests that measure knowledge in specific fields
3220	Knowledge and Understanding of Specialized Processes	- Scores on tests that measure knowledge in specific fields
3310	Research and Scholarship Knowledge and Understanding	- Number of publications by students
		- Number of publications by faculty
3400	Art Forms and Works	- Specific accomplishments in the arts by discipline or department

RESOURCE AND SERVICE PROVISION OUTCOME (Code 4000) CATEGORIES

4110	Provision of Facilities	- Number of books in library
		- Number of courts in the Recreation Center
		- Number and type of computers
		- Number of keypunch machines
4120	Provision or Sponsorship of Events	- Number of events and type sponsored by departments or university
4210	Teaching	Handbook on evaluations of specific instructors
4220	Advisory and Analytic Assistance	- Number of advisors available to students
		- Technical assistance available to students
4230	Treatment, Care, and Referral Services	- Student health center
		- Mental health facility
		- Personal counseling
		- Day care center

PROCESS NO. 1--DEVELOPING OUTCOMES LISTS

Process 1 was used to develop a list of important outcomes irrespective of the current list. Such a list will vary depending upon the values of the planning group making the decision: for example, faculty, students, administrators, legislators. However, an overall institution-wide approach was taken.

The "audience" focus was limited to "current students" in order to limit the scope of Process 1. The five major categories of the type-of-outcome dimension were outlined on a sheet of paper that was titled "audience--currently enrolled students". Then, under each major category, all subcategories at the second and third levels of detail were considered for importance. The detailed subcategories were then used to stimulate thinking about specific outcomes that could be considered "essential" or "important". Aiding in this process for each subcategory were: (1) A product/event/condition typology, (2) a maintenance/chance typology, (3) an output/impact typology, and (4) and an intended-unintended/valued-not valued typology.

Table 2 presents Structure categories left out of the original University of Colorado listing that were identified during this project as important categories for the University and its students. Also included are the specific priority outcomes that were identified for each category.

Table 2

IMPORTANT STUDENT OUTCOMES ITEMS IDENTIFIED
THAT WERE NOT ON THE ORIGINAL
UNIVERSITY OF COLORADO LIST

NCHEMS Category Code Number	NCHEMS Type-of-Outcome Category Name	Items to be Added to the University of Colorado Outcomes List
	ECONOMIC OUTCOME (Code 1000) CATEGORIES	
1120	Economic Flexibility and Independence	- Social Mobility
1130	Standard of Living	- Family assests (other than income)
	HUMAN CHARACTERISTIC OUTCOME (Code 2000) CATEGORIES	
2240	Expression and Communication Skills	- Self-perception of skills in the foreign languages
2260	Interpersonal, Leadership and Organization Skills	- Self-perception of interpersonal and leadership skills
		- Positions held in organizations that require leadership
2630	Dependability and Responsibility	- Self-perception of dependability and responsibility
		- Employer's opinion
2650	Flexibility and Adaptability	- Self-perception of adaptability (other than in job changes)
	KNOWLEDGE, TECHNOLOGY, AND ART FORM OUTCOME (Code 3000) CATEGORIES	
1330	Knowledge and Understanding of General Theory	- Score on tests measuring comprehension of general theories
3230	Knowledge and Understanding of Specialized Theory	- Scores on tests measuring theoretical knowledge in specific fields

CONCLUSION

As a result of this tryout of the NCHEMS Outcomes Structure, some impor-
tant outcomes information were discovered to have been omitted in the original
list. The Structure served as a reminder of the breadth of outcome items assoc-
iated with each outcome category. For example, the category "Competence and
Skills" indicated that Expression and Communication Skills such as skills in
the foreign languages were important indicators of entering students' ability.
Basic speaking, writing, and reading skills in the English language were con-
sidered to be the primary indicators in the orginal outcomes list. As a result,
the list and the Freshman Questionnaire were modified.

The final distribution code numbers indicated that the Boulder Campus out-
comes list is predominately comprised of human characteristics. This is be-
cause the variables in the Model are primarily "student-oriented" outcomes.

In addition, the classification of unique "audiences" will be valuable to
the Boulder Campus as the outcomes information is incorporated into reports.
A public relations staff can categorize outcomes items that would be useful to
particular audiences. For example, research projects completed by graduate
students may be of interest to the following audiences: 1) current students,
2) public school districts, 3) industry and business, 4) citizens and policy-
makers of Colorado. Short executive summaries written for particular audiences
can be developed which communicates this information.

The organization which results from the classification into "type of
outcome" can help campus leaders and representatives report the outcomes of
educational programs more effectively. Information can be stored in computer-
ized student information systems keyed to the NCHEMS classification codes.
The classification system can also be used to organize reference materials
collected on outcome variables.

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